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AZ CORP COMMISSION
Our File Number 38655-00008

June 18, 2002

VIA HAND DELIVERY

Arizona Corporation Commission
Docket Control – Utilities Division
1200 W. Washington Street
Phoenix, Arizona 85007

Re: ACC Amended Decision No. 62995
Duke Energy Arlington Valley, LLC
Docket No: L-00000P-99-0098

Attached is an original and ten (10) copies of Duke Energy Arlington Valley, LLC's Annual Report Regarding the Land Management Plan for the Arlington Valley Energy Project. This Report is being filed in compliance with condition No. 13 (iv) in ACC Amended Decision No. 62995.

Very truly yours,

LEWIS AND ROCA LLP

Thomas H. Campbell

THC/bjg
Enclosures

cc: Pat Williams
Docket No: L-00000P-01-0117

Arizona Corporation Commission
DOCKETED

JUN 18 2002

DOCKETED BY

CAH

Duke Energy Arlington Valley, LLC

**Annual Report Regarding the
Land Management Plan
For the
Arlington Valley Energy Project**

June 2002

Background

On July 25, 2000, the Arizona Corporation Commission issued Decision No. 62740 amended in Decision No. 62995, November 3, 2000 granting a Certificate of Environmental Compatibility to Duke Energy Arlington Valley, LLC ("Duke Energy"). This Certificate was granted with 14 specific conditions. Condition 13 was added to address concerns raised by the Power Plant and Transmission Line Siting Committee regarding the manner in which Duke Energy was to manage the property it had acquired for water rights.

Specifically, Condition 13 states:

Applicant shall implement a Land Management Plan that includes:

- (i) Installation of a professionally designed landscape plan for the entrance of the facility and along Elliot Road.
- (ii) A comprehensive revegetation program that will restore a large portion of the property with plant communities similar to the adjacent desert lands.
- (iii) A partnership with The Arizona Game and Fish Department to provide enhanced wildlife habitat on lands that border Centennial Wash.
- (iv) An annual report (for six years) submitted to the Arizona Corporation Commission setting forth the status of the Land Management Plan.

In April 2000, Duke Energy prepared a document entitled Land Management Plan for the Arlington Valley Energy Project. This document was entered into the record, as Exhibit A-6, during Duke Energy's CEC hearing before the Power Plant and Transmission Line Siting Committee. The Land Management Plan divides the property into five distinct zones. Duke Energy and its partners in the Land Management Plan set forth unique management plans for each of the five zones. The five zones and management objectives were set forth in the Land Management Plan as follows:

Zone 1: Landscape Plan

Duke Energy will retain a professional landscaping firm to design and implement a landscape plan for the southern edge of Elliot Road in front of the facility and both sides of the entrance road to the facility to help screen the facility from view.

Zone 2: Agricultural Lands Reclamation – actively farmed

This zone will remain in active agricultural production as long as reasonable to maintain the irrigation ditches in good working order and prevent potential dust and weed problems. When it is no longer reasonable to keep the land in agriculture, the land will be folded into the active reclamation activities described under Zone 3.

Zone 3: Agricultural Lands Reclamation – fallow agricultural land

This zone includes fallow agricultural lands. In order to better understand how to effectively implement a long-term revegetation strategy, Duke Energy has contracted with the University of Arizona. Pursuant to this contract, the University will undertake a study that would investigate revegetation on arid lands. The preliminary plan for the investigation was set forth in the April 2000 Land Management Plan. A revised plan is included in the detailed discussion below.

Zone 4: Wildlife Habitat Management Area

This zone was set aside for cooperative efforts to utilize the land for a wildlife habitat area. To that end, Duke Energy has partnered with the Arizona Game and Fish Department to find appropriate uses of this property.

Zone 5: Centennial Wash

The Land Management Plan proposes to leave this area intact.

Management Plan Report

Zone 1: Elliot Road and Facility Entrance Road.

Goal: Develop a visual buffer between the facility and Elliot Road.

Progress:

Duke Energy has worked with Todd & Associates, Inc. in upgrading the initial landscape concept plans for the Elliot Road frontage and entry road. This has resulted in substantially more landscape area along the entirety of the Elliot Road frontage, allowing for additional berming and plant material to provide visual buffering from the roadway. Initial plans indicated a 100' landscape strip immediately adjacent to the right-of-way, where as the built condition extends from between 350' to 800' beyond.

Duke Energy has contracted with Valley Crest to install the final landscape and irrigation per plans as prepared by Todd and Associates, Inc. Duke's forces have completed the installation of the berming, and landscape construction is currently at 80% completion. The irrigation system has been installed, including the pump station and storage tank, and is fully operational. All of the trees and Saguaro are installed, and shrub and groundcover materials are currently being installed.

The landscape palette consists of arid-adapted plant species, and specifically those tolerance to salt and alkalinity. These have been successful to date, in that, of the 500+ trees planted, only 2 have had to be replaced. The success of the shrub plantings has yet to be established, but is anticipated to have similar success in that the water quality that is being provided from the new well is better than expected.

Anticipated completion of landscape construction is by July of this year. Duke anticipates contracting with the landscape contractor for ongoing landscape maintenance, since this will be a critical factor in the long term success of the landscape.

With the completed installation of the berming and the trees on the site, it is apparent that the goal as stated is being met. The berming as installed acts as an immediate visual buffer between Elliot Road and the facility. The plant materials, even though immature at this time, do add somewhat to the immediate buffering, and will continue to do even more so as they mature. It is Duke's intent to allow the trees to mature per their natural growing conditions, i.e., they will be allowed to canopy out and remain as multiple trunk specimens. This will add greatly to the buffering value of the landscape. Also, the shrub plantings will be allowed to naturalize, adding even more visual buffering from the roadway. Attached as exhibit 1 are a series of photographs showing the state of the landscaping installation as of May of 2002.

Zone 2 and 3 : Agricultural Lands.

Goal: Reestablish arid adapted vegetation that is self-sustaining and representative of adjacent plant communities.

As set forth in the April 2000 Land Management Plan, Duke Energy will revegetate a large portion of the fallow agricultural lands. In order to understand how to

effectively implement a long-term revegetation strategy, Duke Energy has contracted with the University of Arizona, Office of Arid Lands Studies. Pursuant to this contract, the University will undertake a study that would investigate the best methods for large-scale revegetation on arid lands. The preliminary plan for the investigation was set forth in the April 2000 Land Management Plan. The University of Arizona for inclusion in this document prepared an updated report.

SECOND ANNUAL ARLINGTON VALLEY RETIRED FARMLAND DESERT REVEGETATION REPORT

Prepared by T. M. Bean, M. M. Karpiscak and S. E. Smith
The University of Arizona, Tucson, Arizona
May 2002

Summary of Previous Report

As part of the Land Management Plan for the Arlington Valley Energy Project, the University of Arizona has begun to study the implementation of a comprehensive revegetation program to restore a large portion of the property with self-sustaining plant communities similar to the adjacent desert lands. The primary purpose of this revegetation program is to return these former agricultural lands to beneficial use as open space that will attract wildlife and enhance the surrounding environment. The scope of this project is large: approximately 732 ha (1,810 ac) of retired agricultural land exists on the site, having lain fallow for a period of 5 to 15 years, as well as an additional 368 ha (910 ac) of currently farmed agricultural lands. A small, 7 ha (16 ac) planting was made in March 2001 to test appropriate irrigation methods and plant materials. A scaled-up planting of 83 ha (206 ac) was made in November 2001 based on the results of the March planting. This report presents the results from both the March and November 2001 plantings at Arlington Valley Energy.

I. DESCRIPTION OF MARCH 2001 PLANTING

The March 2001 test plot was designed to evaluate the effectiveness of different revegetation techniques in establishing native vegetation. The test plot measured approximately 366 x 219 m (1,200 x 700 ft) (E-W by N-S), or 8 ha (20 ac). A concrete-lined irrigation carry ditch ran along the west side of the plot. Rows representing different treatments were spaced 3 m (10 ft) apart and ran in an east to west direction. Each row was 335 m (1,100 ft) long, leaving 15 m (50 ft) at each end for equipment to maneuver. Treatments were assigned to rows in a random block design with four replications. A combination rabbit/cattle fence was constructed around the perimeter of the four blocks, and selected treatments were replicated outside the fence to evaluate the effects of herbivory.

Treatments included different combinations of irrigation method, plant materials, and field preparations. The different irrigation regimes tested include no irrigation,

furrow irrigation, and drip irrigation. The no irrigation treatments were thrown out of the data analysis because they were accidentally watered an unknown number of times. These watering regimes were tested in conjunction with mechanically planted transplants from rose pots, manually planted transplants from rose pots, manually planted transplants from 3.8-l containers (Table 1), a native seed mix (Table 2) applied with a no-till grain drill (range drill) at 1.1 g m^{-1} or 670 pure live seeds m^{-1} (eight times the seeding rate of 82 pls m^{-1} recommended by the NRCS), and no plant materials at all. Furrow-irrigated transplants in rose pots were planted at 988 plants ha^{-1} , while drip-irrigated rose pots and all transplants in 3.8-l containers were planted at 1,976 plants ha^{-1} . Deep ripping consists of pulling a metal shank (generally 46-61 cm in length) or set of shanks, called a "ripper," through the soil to break up any hardpans. Deep ripping and the fertigation application of a pre-emergent herbicide (Prowl) were then applied to certain treatment combinations. We were hoping to pre-irrigate selected rows before planting, but the pump became operational only a few days before the planting and so there was not enough time to permit it. Plants were watered via drip- or furrow-irrigation approximately every 2 wk through the summer, then once a month during the winter. Although a meter was installed on the well in order to monitor water usage for the revegetation, water trucks used the well frequently, minimizing the usefulness of these data. Plants will be watered for three years to simulate a series of above average precipitation years, as would be associated with plant establishment in arid areas.

March 2001 Monitoring

Plant establishment and survival were used to monitor the success of the March 2001 plantings. Transects (100 m, $n = 22$) ran in the direction of irrigation (W-E) and were located approximately 80 m from the concrete ditch on the west edge of the field to avoid any edge effect and reduce any effect from the velocity of water within furrows. The exceptions to this were the transplants from the 3.8 l containers, which were all planted at the east end of the field, and the manually planted transplants from rose pots, which were all planted on the west side of the field. The transplants from the 3.8 l containers were monitored separately using six 30 m transects (three for drip irrigated transplants and three for furrow irrigated transplants) randomly chosen from the transplanted rows. The manually planted transplants from rose pots were monitored in the two rows where they were planted using two 30 m transects. Due to the small sample size, manually planted rose pots transplants were not analyzed separately but were included with data from the furrow-irrigated, mechanically-transplanted rose pot transplants. Differences in plant survival by plant materials and irrigation method were calculated using Wilcoxon Rank Sum tests.

Description of November 2001 Planting

Based on the preliminary results of the March 2001 planting we planted an additional 83 ha of retired cropland in November 2001. All fields were irrigated by a drip irrigation system modeled after those used in vegetable production near Yuma, Arizona. Drip lines (rows) were spaced 6 m apart, and emitters are also spaced 6 m

apart. Drip lines were buried approximately 15 cm below the soil surface and a pre-emergent herbicide (Prowl) was incorporated (2.5 l ha^{-1}) at the same time that the lines were installed. No seed was included in this planting. The irrigation infrastructure was tested one month prior to planting to ensure that any potential problems could be addressed. All plants were transplanted into moist soil. We manually planted transplants in rose pot transplants, paper pot transplants, and 3.8 l transplants at a density of 250 plants per ha (Table 3), except for one field, which was planted with rose pots at 500 plants per ha. Plants were watered via the drip system approximately every 2 wk. Water usage for the November 2001 planting was $1.3 \times 10^5 \text{ l (ha)}^{-1}$ over approximately 3 mo. As, with the March planting, plants will be watered for three years to simulate a series of above average precipitation years, as would be associated with plant establishment in arid areas.

November 2001 Monitoring

Plant survival for the November 2002 Duke Energy North America Arlington Valley Energy Project revegetation planting was monitored by establishing five 300-m transects along randomly chosen rows in four selected fields. Fields were selected to represent each of the three transplant container sizes, plus an additional field of transplants from rose pots that received very high herbivory from rabbits and deer. We chose to monitor this field because it had been very recently ($< 3 \text{ mo}$) retired from alfalfa production, while the other fields had lain fallow for the past 15-20 yr. The high level of herbivory experienced in this field became an unplanned treatment, and we were able to informally compare survival to fields experiencing much lower levels of herbivory. Each 300 m transect contains 50 emitters, and plant survival by species was recorded at each emitter. Differences in plant survival by field (container size) were calculated using Wilcoxon Rank Sum tests.

Results From March and November 2001 Plantings

Mean survival across all treatments varied from 30% (SE = 8.3) at one year from planting for the March 2001 planting to 64% (SE = 5.3) at four months from planting for the November 2001 planting. For the March planting, survival was highest for the 3.8-l transplants over all species, and did not differ by irrigation method (Table 4). Mean survival of drip-irrigated rose pot transplants was higher than furrow-irrigated rose pot transplants, which did not differ from mean seedling establishment and survival. However, survival did not differ between drip- and furrow-irrigated rose pot transplants for *Ambrosia deltoidea*. Mean seedling establishment and survival did not differ between irrigation types except for *Baileya multiradiata*, which had significantly higher survival with drip compared to furrow irrigation. Drip-irrigated rose pot transplants were intermediate in survival, being lower than 3.8-l transplants and higher than furrow-irrigated transplants and seed. However, this was not true for *A. deltoidea*, as no difference in survival was detected between furrow- and drip-irrigated rose pot transplants. Rose pot transplants of *A. deltoidea* had higher survival than seed.

As in the March planting, survival was highest for the 3.8-l transplants in the

November planting (Table 5). Some exceptions to this were *Atriplex canescens*, *A. lentiformis*, *A. polycarpa*, and *Pleuraphis rigida*, for which survival did not differ among 3.8-l, paper pot, and rose pot transplants. Mean survival for most of the species planted did not differ for paper pot and rose pot transplants. This is not true for *Larrea tridentata*, which had significantly higher survival in paper pot than in rose pot transplants. Survival was lowest for rose pot transplants subjected to high herbivory. Exceptions to this include *Acacia greggii*, *Lycium exsertum*, *Parkinsonia microphylla*, *Pleuraphis rigida*, *Prosopis velutina*, and *Sphaeralcea ambigua*, for which survival of rose pots exposed to high herbivory did not differ from those not exposed. It is important to note that mean survival listed in Table 5 for the different propagule types was calculated using all species planted. However, when only those species common to all propagule types are included the order of the differences in survival remain the same. Rose pot transplants exposed to high herbivory had 17.1% survival, rose pot transplants not exposed had 62.6% survival, paper pot transplants had 69.5% survival, and 3.8-l transplants had 96.0% survival. These values closely approximate those calculated for all species (Table 5).

Herbivory became an unplanned treatment for the rose pot transplants. As previously noted above, one very recently retired field was selected for planting during November 2001. This field bordered a densely vegetated wash on one side, and abutted against native vegetation on two other sides. This field was isolated from the remainder of the planting by a wash. The dense vegetation surrounding the field supported a population of cottontail and jackrabbits (*Lepus* and *Sylvilagus* spp.) that exerted high herbivory pressure on the revegetated field. Mule deer (*Odocoileus hemionus*) were also observed in the field. This field is referred to as "rose pots east," because it was located east of the wash. Other fields planted in November were surrounded by retired cropland, which was typified by a lack of vegetative cover. These fields did not experience high herbivore pressure.

II. DISCUSSION

Overall survival was higher for the November planting than the March planting. Mortality in the areas planted in March 2001 leveled off after 30 to 60 days and plant densities have remained relatively constant since. Mortality in the areas planted in November 2001 has not completely leveled off but is low. The largest drop in plant densities was observed in *L. tridentata* in the paper pot transplants, which declined by 6% during the last month of monitoring. The major differences between the March and November plantings were the complete exclusion of furrow irrigation and mechanical planting treatments, which were the least successful techniques used in March. Additionally, plant materials were pre-ordered eight months in advance from commercial nurseries. The plants were generally larger and appeared more vigorous in the November planting than those used in March. Seed was also excluded from the November planting because we were unable to predict the species composition of seeded areas. Weeds have also been a concern, especially *Salsola tragus*, and this was even more of a problem in seeded treatments, as we were unable to apply a pre-emergent herbicide prior to planting.

Although some may argue that we should only be concerned about the survival of

L. tridentata and *A. dumosa* as these are the two most frequent (60%) species in the undisturbed adjacent areas (Table 1), I would disagree for two reasons. First, as I have stated before, we have chosen the creosotebush-white bursage series/ saltbush series ecotone as the target community for this restoration. Thus, we have included three species as dominants in our mix: *L. tridentata*, *A. dumosa*, and *Atriplex polycarpa*. Second, when dealing with severely disturbed sites such as retired farmland, planting as diverse a species mix as possible can provide a measure of insurance in the case that the species targeted to be dominant at the site prove to be no longer adapted to post-disturbance conditions. This is why I have presented information for each of the planted species and not just the dominants.

In the March planting, survival for the 3.8-l transplants was most likely higher than the rose pot transplants because the larger plants were less susceptible to desiccation and other environmental stresses than were plants from the smaller plants. Weather was hot ($> 32^{\circ}\text{C}$) and windy on the day of planting. Potting mix was also an issue for the March planting, as rose pots were potted in a 1:1 mix of perlite and vermiculite, which fell apart upon removal from the pot. This was presumably very stressful to the plant roots. Transplants from 3.8-l containers were potted in commercial-grade potting mix, which held together well upon removal from the pot. Root development may have also played a part, as 3.8-l transplants had much more extensive root systems than the rose pot transplants. Furthermore, all 3.8-l transplants were planted by hand rather than by a transplanting machine as were the rose pot transplants. The mechanical planter functioned poorly on the largely undisked and ungraded field, leaving many of the small plants only partially planted. These factors may have also made it possible for the 3.8-l transplants to withstand furrow irrigation better than the rose pot transplants. However, species-specific tolerances to flooding may have also played a role.

Flooding tolerance may have also affected seed and seedling survival in furrow-irrigated rows. Although no statistically significant differences were found in survival between furrow- and drip-irrigated rows, most species did not germinate at all in furrow-irrigated rows. Overall survival was low, but it is important to note that survival for seed is not equivalent to survival of transplants, as mentioned before. Seedling establishment and survival ignores viable seeds that retain the ability to germinate in the future. Another factor affecting seedling establishment and survival is the suspicion that small portions of some seeded rows were sprayed with herbicide (glyphosphate). It seems that emerging seedlings may have been mistaken as weeds by herbicide applicators.

In November, survival for 3.8-l transplants was higher than other container sizes, but probably not for the same reasons as in the March planting, as stricter controls were in place. Potting mix was uniform for all pot sizes and root balls held together well. All plants were planted by hand and received drip irrigation. Weather was cool ($< 25^{\circ}\text{C}$) and not windy during the days of planting. Plant survival was highest in the 3.8-l transplant size, probably because certain species (especially *A. dumosa* and *L. tridentata*) had poor survival in everything but 3.8-l transplants.

These species should apparently be planted from 3.8-l or larger size containers only. Some species had poor survival in rose pot transplants (*P. microphylla* and *S. ambigua*) but were not planted in other sizes. Survival of these species should be evaluated when transplanted from larger container sizes. Only one species, *B. multiradiata*, had poor survival of 3.8-l transplants.

This document contains excerpts from a presently unpublished thesis:

Bean, T. M. 2002. Revegetation in south central Arizona: a demonstration of technology. Master's Thesis. University of Arizona, Tucson. 53 pp.

Table 1: Plant materials used in the March 2001 planting.

Botanical Name	Common Name	Seed	Rose-pot	
			transplants	3.8-l transplants
<i>Acacia Greggii</i>	Catclaw Acacia	x		x
<i>Ambrosia deltoides</i>	Triangleleaf Bursage	x	x	
<i>Ambrosia dumosa</i>	White Bursage	x		
<i>Aristida purpurea</i>	Purple Threeawn	x		
<i>Atriplex canescens</i>	Fourwing Saltbush	x		
<i>Atriplex lentiformis</i>	Quailbrush	x		
<i>Atriplex polycarpa</i>	Desert Saltbush	x		x
<i>Baileya multiradiata</i>	Desert Marigold	x		
<i>Bouteloua aristidoides</i>	Needle Grama	x		
<i>Calliandra eriophylla</i>	Fairy Duster	x		
<i>Cassia covesii</i>	Desert Senna	x		
<i>Festuca microstachya</i>	Desert Fescue	x		
<i>Larrea tridentata</i>	Creosote	x	x	
<i>Lesquerella Gordoni</i>	Gordon's Bladderpod	x		
<i>Lycium exsertum</i>	Wolfberry	x		x
<i>Olneya tesota</i>	Ironwood	x		
<i>Opuntia acanthocarpa</i>	Buckhorn Cholla	x		
<i>Parkinsonia microphylla</i>	Littleleaf Palo Verde	x		
<i>Plantago ovata</i>	Indianwheat	x		
<i>Pleuraphis rigida</i>	Big Galleta	x		
<i>Prosopis velutina</i>	Velvet Mesquite	x		x
<i>Sphaeralcea ambigua</i>	Desert Globemallow	x		
<i>Sphaeralcea Coulteri</i>	Coulter's Globemallow	x		

Table 2: Description of seeding mix used in the March 2001 planting

Species	Weight (g)	Pure Live Seeds	% in Mix by PLS
<i>Acacia greggii</i>	608.2	3,352	0.0%*
<i>Ambrosia dumosa</i>	547.2	102,541	1.5%
<i>Aristida purpurea</i>	631.4	347,978	4.9%
<i>Atriplex canescens</i>	209.3	23,994	0.3%
<i>Atriplex lentiformis</i>	458.9	505,807	7.2%
<i>Atriplex polycarpa</i>	554.8	978,535	13.8%
<i>Baileya multiradiata</i>	492.2	1,150,316	16.3%
<i>Bouteloua aristidoides</i>	252.3	230,314	3.3%
<i>Calliandra eriophylla</i>	425.1	16,867	0.2%
<i>Cassia covesii</i>	343.9	83,391	1.2%
<i>Festuca microstachya</i>	439.0	1,493	0.0%*
<i>Larrea tridentata</i>	424.1	387,096	5.5%
<i>Lesquerella gordonii</i>	517.2	779,465	11.0%
<i>Lycium exsertum</i>	427.8	74,805	1.1%
<i>Olneya tesota</i>	659.2	456,057	6.5%
<i>Opuntia acanthocarpa</i>	1,317.5	471,514	6.7%
<i>Parkinsonia microphylla</i>	150.5	3,546	0.1%
<i>Plantago ovata</i>	473.2	290,468	4.1%
<i>Pleuraphis rigida</i>	1,010.2	339,056	4.8%
<i>Prosopis velutina</i>	796.9	23,719	0.3%
<i>Sphaeralcea ambigua</i>	392.8	433,021	6.1%
<i>Sphaeralcea coulteri</i>	332.1	366,056	5.2%
TOTAL	11,463.7	7,069,392	100.0%

*Values presented are rounded to the nearest tenth. Thus, a value of 0.0% indicates that less than 0.05% of all seeds in the mixture are of that species.

Table 3: Plant materials used in the November 2001 planting

Botanical Name	Rose-pot	Paper-pot	3.8-l transplants
	transplants	transplants	
<i>Acacia Greggii</i>	X		
<i>Ambrosia dumosa</i>	X	X	X
<i>Aristida purpurea</i>	X		
<i>Atriplex canescens</i>	X	X	X
<i>Atriplex lentiformis</i>	X	X	X
<i>Atriplex polycarpa</i>	X	X	X
<i>Baileya multiradiata</i>			X
<i>Larrea tridentata</i>	X	X	X
<i>Lycium exsertum</i>	X		
<i>Parkinsonia microphylla</i>	X		
<i>Pleuraphis rigida</i>	X	X	X
<i>Prosopis velutina</i>	X		
<i>Sphaeralcea ambigua</i>	X		

Table 4: One-year survival (% , standard errors listed in parentheses) of species planted by propagule type, container size, and irrigation method at Arlington Valley Energy in March 2001

Species	Propagule type, container size, and irrigation					
	Seed w/ drip irrigation*	Seed w/ furrow irrigation*	Rose pots w/ drip irrigation*	Rose pots w/ furrow irrigation*	3.8-l transplants w/ drip irrigation*	3.8-l transplants w/ furrow irrigation*
<i>Acacia greggii</i>	2.1 (7.5) ^b	2.1 (7.5) ^b	NP	NP	86.7 (7.5) ^a	93.3 (7.5) ^a
<i>Ambrosia deltoidea</i>	0.0 (4.9) ^b	0.0 (4.9) ^b	13.9 (4.2) ^a	1.1 (3.4) ^a	NP	NP
<i>Ambrosia dumosa</i>	0.1 (0.1)	0.0 (0.1)	NP	NP	NP	NP
<i>Atriplex canescens</i>	1.0 (0.3)	0.0 (0.3)	NP	NP	NP	NP
<i>Atriplex lentiformis</i>	0.3 (0.1)	0.0 (0.1)	NP	NP	NP	NP
<i>Atriplex polycarpa</i>	0.0 (11.5) ^b	0.0 (11.5) ^b	NP	NP	60.0 (11.5) ^a	60.0 (11.5) ^a
<i>Baileya multiradiata</i>	0.1 (0.0) ^a	0.0 (0.0) ^b	NP	NP	NP	NP
<i>Cassia covesii</i>	0.2 (0.1)	0.0 (0.1)	NP	NP	NP	NP
<i>Larrea tridentata</i>	0.0 (5.1) ^b	0.0 (5.1) ^b	30 (4.4) ^a	3.0 (3.6) ^b	NP	NP
<i>Lycium exsertum</i>	0.2 (16.7) ^b	0.0 (16.7) ^b	NP	NP	66.7 (16.7) ^a	80.0 (16.7) ^a
<i>Parkinsonia microphylla</i>	2.3 (3.7)	4.6 (3.7)	NP	NP	NP	NP
<i>Prosopis velutina</i>	2.0 (3.4) ^b	0.9 (3.4) ^b	NP	NP	100.0 (3.3) ^a	86.7 (3.3) ^a
<i>Sphaeralcea ambigua</i>	0.0 (0.0)	0.0 (0.0)	NP	NP	NP	NP
Mean survival	0.1 (4.5) ^c	0.0 (4.5) ^c	24.8 (3.9) ^b	2.5 (3.2) ^c	83.3 (4.5) ^a	81.7 (4.5) ^a

Due to the small sample size, differences were tested using Wilcoxon Rank Sum tests. Values within the same row with different superscript letters are significantly different at the $P < 0.05$ level. All planted are irrigated twice per month via drip or furrow irrigation.

*See note in introduction on difference between seed and transplant survival.

“NP” = Not Planted

Table 5: Four-month survival (% , standard errors listed in parentheses) of species planted by container size at the Arlington Valley Energy property in November 2001

Species	Container size			
	Rose pots east (%)	Rose pots west (%)	Paper pots (%)	3.8-l transplants (%)
<i>Acacia greggii</i>	80.0 (9.3)	86.8 (9.3)	NP	NP
<i>Ambrosia dumosa</i>	27.2 (10.4) ^b	44.0 (10.4) ^b	52.9 (10.4) ^{ab}	93.5 (10.4) ^a
<i>Atriplex canescens</i>	10.0 (10.5) ^b	100.0 (10.5) ^a	87.5 (10.5) ^a	90.3 (10.5) ^a
<i>Atriplex lentiformis</i>	25.0 (21.1) ^b	100.0 (21.1) ^a	90.0 (18.9) ^{ab}	100.0 (18.9) ^a
<i>Atriplex polycarpa</i>	13.4 (9.3) ^b	79.3 (9.3) ^a	75.5 (9.3) ^a	97.8 (9.3) ^a
<i>Baileya multiradiata</i>	NP	NP	NP	49.7 (10.1)
<i>Larrea tridentata</i>	7.6 (6.0) ^d	36.0 (6.0) ^c	64.3 (6.0) ^b	96.7 (6.0) ^a
<i>Lycium exsertum</i>	90.3 (5.5)	95.0 (6.1)	NP	NP
<i>Parkinsonia microphylla</i>	8.3 (11.6)	15.0 (9.0)	NP	NP
	60.0 (10.6)	93.3 (10.6)	100.0 (10.6)	95.0 (10.6)
<i>Prosopis velutina</i>	79.3 (7.7)	92.0 (7.7)	NP	NP
<i>Sphaeralcea ambigua</i>	8.3 (19.4)	33.3 (22.4)	NP	NP
Mean survival	31.2 (4.3) ^c	66.0 (4.3) ^b	69.6 (4.3) ^b	91.2 (4.3) ^a

Due to the small sample size, differences were tested using Wilcoxon Rank Sum tests. Values with different superscript letters are significantly different at the $P < 0.05$ level. All planted are irrigated twice per month via drip irrigation.

“NP” = Not Planted

Zone 4: Wildlife Habitat Management Area

Goal: Provide enhanced wildlife habitat in the project area.

Under an agreement to provide survey and design services to Duke Energy, Ducks Unlimited, Inc. (DU) has been performing engineering and survey related activities during the months of May and June 2002 at the site of Duke Energy’s Arlington Valley Energy Project, Arlington, Arizona. This effort will allow the development of master planning options for the property. The property surveyed covers approximately 1,500 acres and is located just north of the Centennial Wash and the Gila River.

As of Monday, June 10, 2002, DU had collected survey data that will be used to document existing water delivery means and methods employed by a current farming operation within the western half of the site. Collected data include ditch cross-sections, elevations, and various irrigation gate locations and dimension. Data was

also collected to describe the wells / pump systems on site. Some survey work remains, including the collection of spot topographic data to finalize the development of contours of various farmed fields as well as adjoining lands that at one time (prior to 1980) had been utilized for agricultural purposes. DU anticipates that the fieldwork associated with map preparation will be completed by mid June 2002.

Concurrent with the performance of field survey activities, DU engineers and biologists have visited the site on several occasions as part of developing options and concepts for future uses for the 1,500 acres. Possible land uses include wetland / waterfowl habitat development, creation of native desert habitat, and other scenarios as dependent on soil types, water availability, topographic information, and current vegetative cover.

DU anticipates that office work associated with the development of conceptual plans will commence in July 2002 once a base map has been finalized. Options will be developed in concert with input from Duke staff. In addition, DU will likely utilize the results of recent desert habitat restoration efforts performed by Duke representatives within adjacent sections of their property to refine options proposed. Once completed, DU will present these conceptual options to Duke as part of a report prepared summarizing the work. DU anticipates that this report will be finalized in mid to late summer 2002.

Zone 5: Centennial Wash

Goal: Protect existing riparian vegetation

The project contains only a small portion of land that has not been extensively managed for agricultural production. This area located in the southeastern portion of the site is in Centennial Wash and contains a functioning riparian ecosystem. Duke Energy continues to maintain the area in its current state.

Conclusion

The Land Management Plan for the Arlington Valley Energy Project is progressing well. Duke Energy continues to work with its outside contractors including a professional landscaping firm, the University of Arizona, and the Arizona Game and Fish Department. These efforts have resulted in the implementation of the landscape plan, a comprehensive test plot by the University of Arizona to study the best methods for large-scale revegetation and conceptual meetings with the Arizona Game and Fish Department regarding enhanced wildlife habitats.

Exhibit 1







